IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	David Gascoyne, et al.	)
		) Group Art Unit: 2876
Serial No.:	10/709,208	)
		)
Filed:	April 21, 2004	) Examiner: MAI, Thien T.
		)
For:	AUTHENTICATION SYSTEM, DATA DEVICE, AND METHODS FOR USING THE SAME	)

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

RESPONSE TO FINAL OFFICE ACTION

Sir:

This Amendment is submitted in response to the Final Office Action dated March 29, 2006.

IN THE CLAIMS

1. (Original) An authentication system, comprising:

a first light source having a first light source spectral distribution and being capable of providing sufficient excitation to produce a photoluminescent emission from a medium comprising a luminescent tag and a color, wherein the photoluminescent emission has a photoluminescence intensity;

a second light source having a visible multi-wavelength spectral distribution and being capable of providing sufficient visible multi-wavelength illumination of the medium to generate a second analog response, wherein the second analog response is different from the photoluminescent emission; and

at least three optically filtered light sensing devices for detecting analog emission intensity in a spectral sensitivity range;

wherein each light sensing device has a different device spectral sensitivity range which includes at least a portion of the visible multi-wavelength spectral distribution;

wherein the device spectral sensitivity range of at least one of the light sensing devices includes at least a portion of a desired photoluminescent emission wavelength range; and

wherein each light sensing device is configured to receive at least one of the photoluminescent emission and the second analog signal.

2. (Original) The authentication system of Claim 1, further comprising a comparator in operable communication with the light sensing devices and capable of receiving a detected signature from the light sensing devices and of determining whether the detected signature is from an authentic medium.

3. (Original) The authentication system of Claim 1, wherein at least one of the first light source and the second light source is a LED.

4. (Original) The authentication system of Claim 3, wherein the first light source is a UV LED and the second light source is a visible LED.

5. (Original) The authentication system of Claim 1, wherein the filtered light sensing devices are filtered photodiodes.

6. (Original) The authentication system of Claim 5, wherein the device spectral sensitivity range of at least two of the filtered light sensing devices includes at least a portion of the desired photoluminescent emission wavelength range.

7. (Original) The authentication system of Claim 6, wherein the device spectral sensitivity range of at least three of the filtered light sensing devices includes at least a portion of the desired photoluminescent emission wavelength range.

8. (Original) The authentication system of Claim 5, wherein the first filtered photodiode is a green filtered photodiode, the second filtered photodiode is a blue filtered photodiode, and the third filtered photodiode is a red filtered photodiode.

9. (Original) The authentication system of Claim 5, further comprising a fourth photodiode having a fourth spectral sensitivity range that is unfiltered in the visible multi-wavelength spectral distribution.

10. (Original) The authentication system of Claim 5, further comprising

a fifth filtered photodiode having a fifth spectral sensitivity range that is different from the device spectral sensitivity ranges of the other filtered photodiodes;

wherein the first device spectral sensitivity range and the second device spectral sensitivity range are greater than or less than a desired peak emission wavelength;

the third device spectral sensitivity range includes the desired peak emission wavelength; and

wherein if the first spectral sensitivity range is greater than the desired peak emission wavelength then the fifth spectral sensitivity range is less than the desired peak emission wavelength, and if the first spectral sensitivity range is less than the desired peak emission wavelength then the fifth spectral sensitivity range is greater than the desired peak emission wavelength.

11. (Original) The authentication system of Claim 10, wherein the second light source includes a desired absorbed wavelength range, and wherein the fifth peak is in the desired absorbed wavelength range.

12. (Original) The authentication system of Claim 5, wherein

the first photodiode has a first peak in a first wavelength range where the photoluminescent emission is at 10% to 70% of a maximum photoluminescence intensity;

the second photodiode has a second peak in a second wavelength range where the photoluminescent emission is at 10% to 70% of the maximum photoluminescence intensity; and

the third photodiode has a third peak in a third wavelength range where the photoluminescent emission is at 70% to 100% of the maximum photoluminescence intensity.

13. (Original) The authentication system of Claim 5, further comprising at least one of

an eleventh photodiode having an eleventh spectral sensitivity range and having an eleventh peak that corresponds to a shortest wavelength of the desired photoluminescent emission wavelength range ±5 nm; and

a twelfth photodiode having a twelfth spectral sensitivity range and having a twelfth peak that corresponds to a longest wavelength of the desired photoluminescent emission wavelength range ±5 nm.

14. (Previously Presented) The authentication system of Claim 5, wherein a thirteenth photodiode having a thirteenth spectral sensitivity range and having a thirteenth peak that is within 100 nm of a longest wavelength at which the desired photoluminescent emission wavelength range has an intensity of less than 1% of a maximum desired photoluminescence intensity.

15. (Original) The authentication system of Claim 5, comprising a fourteenth optically filtered photodiode having a fourteenth spectral sensitivity range that includes the first light source spectral distribution.

16. (Original) The authentication system of Claim 1, wherein the light sensing devices, the first light source, and the second light source are disposed adjacent one another such that the photoluminescent emission and the second analog response can be received by the light sensing devices in a reflectance mode.

17. (Original) The authentication system of Claim 1, further comprising a resistor in electrical communication with the light sensing devices.

18. (Original) The authentication system of Claim 1, further comprising a calibration surface designed and located to enable the authentication system to internally calibrate.

19. (Previously Presented) A data device, comprising:

an authentication analog measurement device capable of detecting a multi-wavelength spectral analog signature of a data storage medium;

a comparator capable of determining if the multi-wavelength spectral analog signature is from an authentic medium, wherein the comparator is in operable communication with the measurement device; and

an information device capable of at least one of reading from and writing to the authentic medium, wherein the information device is in operable communication with the comparator.

20. (Previously Presented) The data device of Claim 19, wherein the data storage medium is selected from the group consisting of a recordable CD, a recordable DVD, a recordable Blu-Ray disc, a recordable EVD, read-only CD, a read-only DVD, a read-only Blu-Ray disc, a read-only EVD, rewritable CD, a rewritable DVD, a rewritable Blu-Ray disc, a rewritable EVD, and a combination comprising at least one of the foregoing data storage media.

21. (Original) The data device of Claim 19, wherein the information device is capable of writing to the authentic medium.

22. (Original) The data device of Claim 21, wherein the device is a digital content kiosk system comprising a data storage medium handling system.

23. (Original) The data device of Claim 22, wherein the data storage medium handling system further comprises a receiver capable of receiving the data storage medium from an external source.

24. (Original) The data device of Claim 19, wherein the measurement device is configured to measure a response to a property of energy selected from the group consisting of light, radio frequency, radioactive, magnetic, and electrical.

25. (Previously Presented) A data device, comprising:

an authentication analog measurement device capable of generating a detected analog signature of a data storage medium;

a comparator capable of determining if the detected analog signature is from an authentic medium, wherein the comparator is in operable communication with the measurement device; and

an information device capable of at least one of reading from and writing to the authentic medium, wherein the information device is in operable communication with the comparator;

wherein the measurement device further comprises

a first light source having a first light source spectral distribution and being capable of providing sufficient excitation to produce a photoluminescent emission from a medium comprising a luminescent tag and a color, wherein the photoluminescent emission has a photoluminescence intensity;

a second light source having a visible multi-wavelength spectral distribution and being capable of providing sufficient visible multi-wavelength illumination of the medium to generate a second analog response, wherein the second analog response is different from the photoluminescent emission; and

at least three optically filtered light sensing devices for detecting analog emission intensity in a spectral sensitivity range;

wherein each light sensing device has a different device spectral sensitivity range which includes at least a portion of the visible multi-wavelength spectral distribution;

wherein the device spectral sensitivity range of at least one of the light sensing devices includes at least a portion of a desired photoluminescent emission wavelength range; and

wherein each light sensing device configured to receive at least one of the photoluminescent emission and the second analog signal.

26. (Previously Presented) The data device of Claim 19, wherein the measurement device is capable of generating at least two different multi-wavelength spectral analog signatures from a read side of the data storage medium.

27. (Original) A method of using a data device, comprising:

illuminating a tested medium with a first light source to produce a tested photoluminescent emission, wherein an authentic medium has an optical photoluminescence identifier with a desired photoluminescence intensity and a desired photoluminescence peak wavelength and has an optical color identifier, and wherein the tested photoluminescent emission has a tested photoluminescence intensity and a tested photoluminescence peak intensity;

illuminating the tested medium with a second light source in the visible wavelength range to produce a second analog response, wherein the second analog response is different from the tested photoluminescent emission;

determining a first intensity of the tested photoluminescent emission, wherein the first intensity is determined in a first wavelength range that includes the desired photoluminescence peak intensity;

determining a second intensity of the tested photoluminescent emission, wherein the second intensity is determined in a second wavelength range that is different than the first wavelength range;

determining a third intensity of the tested photoluminescent emission, wherein the third intensity is determined in a third wavelength range that is different than the first and second wavelength range;

determining if the first intensity, the second intensity, and the third intensity of the tested photoluminescent emission correspond to the optical photoluminescence identifier; and

determining if the second analog response corresponds to the optical color identifier,

wherein if the first intensity, the second intensity, and the third intensity correspond to the optical photoluminescence identifier and if the second analog response corresponds to the optical color identifier, the tested medium is authenticated as the authentic medium.

28. (Original) The method of Claim 27, further comprising determining if a digital identifier is present on the data storage medium.

29. (Original) The method of Claim 27, further comprising writing data to the authentic medium.

30. (Original) The method of Claim 27, further comprising inhibiting the writing to a non-authentic medium.

31. (Original) The method of Claim 27, further comprising inhibiting reading from a non-authentic medium.

32. (Original) The method of Claim 27, wherein the photoluminescent emission is a fluorescence emission.

33. (Previously Presented) A method of using a data device, comprising:

generating a multi-wavelength spectral analog signature from a data storage medium, wherein the multi-wavelength spectral analog signature;

comparing the multi-wavelength spectral analog signature to a desired spectral signature from an authentic medium;

determining if the multi-wavelength spectral analog signature is from an authentic medium; and

controlling an information device based upon whether the multi-wavelength spectral analog signature is from the authentic medium.

34. (Previously Presented) The method of Claim 33, wherein determining if the multi-wavelength spectral analog signature is from an authentic medium further comprises comparing the multi-wavelength spectral analog signature in at least three distinct spectral ranges.

35. (Previously Presented) The method of Claim 33, wherein controlling the information device comprises:

if the multi-wavelength spectral analog signature is from the authentic medium, the information device at least one of reads from and writes to the authentic medium, and

if the multi-wavelength spectral analog signature is from an non-authentic medium, the information device is inhibited from reading from and writing to the non-authentic medium.

36. (Previously Presented) The data device of Claim 19, wherein the authentication analog measurement device is capable of detecting a multi-wavelength spectral analog signature from a photoluminescent emission.

37. (Previously Presented) The authentication system of Claim 2, further comprising a temperature sensor in thermal communication with at least one of the light sensing devices and in operable communication with the comparator.

38. (Previously Presented) The authentication system of Claim 4, wherein the visible LED is a white light LED.

39. (Previously Presented) The authentication system of Claim 4, wherein the visible LED is a white LED having a CIE 1931 chromaticity x = 0.25 to 0.33 and y = 0.21 to 0.42.

40. (Previously Presented) The authentication system of Claim 10, wherein the fifth spectral sensitivity range is equal to the fifth peak ± 30 nm.

41. (Previously Presented) The authentication system of Claim 40, wherein the fifth peak corresponds to a photoluminescence peak intensity of the photoluminescence emission ± 20 nm.

42. (Previously Presented) The authentication system of Claim 41, wherein the fifth peak corresponds to the photoluminescence peak intensity ± 10 nm.

43. (Previously Presented) The authentication system of Claim 42, wherein the fifth peak corresponds to the photoluminescence peak intensity ± 5 nm.

44. (Previously Presented) The authentication system of Claim 10, further comprising

a sixth photodiode having a sixth spectral sensitivity range equal to a sixth peak ± 30 nm; and

a seventh photodiode having a seventh spectral sensitivity range equal to a seventh peak ± 30 nm;

wherein the sixth spectral sensitivity range, the seventh spectral sensitivity, the fifth spectral sensitivity range, and the device spectral sensitivity ranges are different from each other.

45. (Previously Presented) The authentication system of Claim 15, wherein the fourteenth photodiode is a UV photodiode.

46. (Previously Presented) The data device of Claim 25, wherein the information device further comprises a laser and wherein at least one of the first light source and the second light source is the laser.

47. (Previously Presented) The data device of Claim 25, wherein the measurement system is capable of detecting a desired color and a desired photoluminescence emission of the authentic medium.

48. (Previously Presented) The data device of Claim 19, wherein the information device is capable of writing to the authentic medium and of inhibiting writing to an unauthenticated medium.

49. (Previously Presented) The authentication system of Claim 14, wherein thirteenth peak that is within 50 nm of a longest wavelength at which the photoluminescence emission band has an intensity of less than 1% a maximum photoluminescence intensity.

REMARKS

Claims 1 - 49 are pending in the present Application. No claims have been canceled, amended, or added. Claims 1 – 18, 25, 27 – 32, 37 – 47, and 49 have been allowed, leaving Claims 19 – 24, 26, 33 – 36, and 48 for consideration. Reconsideration and allowance of these claims are respectfully requested in view the following remarks.

Allowable Subject Matter

Claims 1 – 18, 25, 27 – 32, 37 – 47, and 49 are allowed.

Claim Rejections Under 35 U.S.C. § 103(a)

Claims 19 – 24, 26, 33, 35 – 36, and 48 stand rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over U.S. Publication No. 2005/0163026 to Oshima, et al. in view of U.S. Patent No. 6,380,547 to Gonzalez, et al. Applicants respectfully traverse this rejection.

The Examiner alleges that Oshima et al. teach a device comprising a reading device capable of generating an analog signal detected by a photo-detector in the reading device, and a comparator that determines the detected signal is from an authentic medium. (Final Office Action dated March 29, 2006 (hereinafter FOA 03/06, page 2)) The Examiner further admits that "Oshima fails to expressly disclose the device capable of detecting multi-wavelength spectral analog signature." (FOA 03/06, page 4)

The Examiner relies upon Gonzalez to allegedly disclose:

> a method/apparatus for determining an authenticity of a storage medium such as CD-ROMs (col.7, line 7+), comprising: generating a multi-wavelength spectrum from the storage medium by exposing it with an excitation light source and storing the fluorescent spectrum from the reflected light emission on a paper, computer memory, or a code encoded on the CD-Rom including the wavelength information of the excitation light (col. 8, lines 60-68, col. 9 lines 1-10);...

(*Id.*) The Examiner then concludes that:

> if the two spectrum yield the same result with decaying factor taken into consideration, then the authenticity of the storage medium is confirmed (col. 8, lines 42 – 50).
>
> Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to employ the marking techniques taught by

> Gonzalez in addition to those of Oshima so that the information on the storage medium is further protected and extremely difficult to be pirated, thus increasing profitability.

(*Id.*)

Obviousness is not based upon what an artisan could do or what an artisan may try, but is based upon what an artisan would be motivated to do with an expectation of success. "Rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *In re Kahn*, No. 04-1616 (CAFC March 22, 2006) citing *In re Lee*, 277 F.3d 1338, 1343-46 (Fed. Cir. 2002); and *In re Rouffett*, 149 F.3d 1350, 1355-59 (Fed. Cir. 1998).

In the present rejection, merely because Gonzalez et al. disclose a method for determining authenticity it is alleged that Gonzalez et al. should be combined with Oshima et al. This is merely a conclusory statement without reasoned support provided by the references of record. "When the [Examiner] does not explain the motivation, or the suggestion or teaching, that would have led the skilled artisan at the time of the invention to the claimed combination as a whole, [it is] infer[ed] that the [Examiner] used hindsight to conclude that the invention was obvious." *Id.*

No motivation has been provided to redesign Oshima et al., which is teaching converting an analog signal to a digital signal and comparing the digital information to a predetermined ID (e.g., a digital watermark as described in Paragraph [0216]) to identify authenticity, to include a luminophore of Gonzalez et al. in the article of Oshima et al., and to change the method of Oshima et al. to use the analog information in the manner taught and claimed in the present application. Obviousness, which must be determined at the time of the present invention and without the insight provided by the present invention, requires motivation from the references as well as an expectation of success. No reference based motivation or expectation of success has been provided. Merely stating that the motivation is "so that the information on the storage medium is further protected and extremely difficult to be pirated, thus increasing profitability" is conclusory and not supported by the references. "Although the suggestion to combine references may flow from the nature of the problem, '[d]efining the problem in terms of its solution reveals improper hindsight in the selection of the prior art relevant to obviousness.'" (internal citation

omitted) *Id.*, quoting *Monarch Knitting Mach. Corp. v. Sulzer Morat GmbH*, 139 F.3d 877, 881 (Fed. Cir. 1998); *In re Beattie*, 974 F.2d 1309, 1312 (Fed. Cir. 1992).

Since there is no motivation to combine Gonzalez et al. with Oshima et al. as suggested in the FOA 03/06, or any expectation of success, and since mere conclusory statements are only evidence of improper use of hindsight, the burden of establishing a *prima facie* case of obviousness has not been met. No *prima facie* case of obviousness has been established. Reconsideration and withdrawal of this rejection are respectfully requested.

Claim 34 stands rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over Oshima et al., modified by Gonzalez et al., and further in view of U.S. Patent No. 5,532,998 to Durham. Applicants respectfully traverse this rejection.

After admitting that Oshima et al. and Gonzalez et al. fail to teach comparing the multi-wavelength spectral analog signature in at least three distinct spectral ranges, the Examiner relies upon Durham to teach

> a[n] optical signature detection system in a storage medium 102, in which a dispersive means in the form of a prism capable of generating multi-wavelength spectral analog signal that is being detected by an array of avalanche photodiodes, wherein each of the photodiodes is capable of detecting a multi-wavelength analog signal.

(FOA 03/06, page 6) Based upon Durham teaching the use of prisms, it is alleged that:

> Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to incorporate the teachings of Durham to those of Oshima/Gonzalez by employing the dispersive means and/or having the medium/tag made of the same contents as the dispersive means...

(*Id.*, page 7) Again this statement appears to be a mere conclusion. It is alleged that merely because Durham teaches prisms and an array of avalanche photodiodes, it would be obvious to modify Oshima/Gonzales. Again, "[r]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *In re Kahn*, No. 04-1616 (CAFC March 22, 2006) citing *In re Lee*, 277 F.3d 1338, 1343-46 (Fed. Cir. 2002); and *In re Rouffett*, 149 F.3d 1350, 1355-59 (Fed. Cir. 1998). "When the [Examiner] does not explain the

motivation, or the suggestion or teaching, that would have led the skilled artisan at the time of the invention to the claimed combination as a whole, [it is] infer[ed] that the [Examiner] used hindsight to conclude that the invention was obvious." *Id.*

In the present case, there is no motivation to take Oshima et al., pick the luminophores from Gonzalez et al., and then to pick the prisms and array of photodiodes from Durham to form a combination. There is no motivation provided by the references, at the time of the present application to make such a combination, there is also expectation of success for such combination, and there is no reason to believe, given the references of record, that an artisan would even combine these references or would combine the references in a manner that would attain the claimed invention. These references do not provide adequate direction to pick and choose selected elements from among the myriad of possibilities to form a the claimed device or method as is instantly claimed. In making a Section 103 rejection, the Examiner bears the burden of establishing a *prima facie* case of obviousness. In re Fine, 5 U.S.P.Q. 2d 1596, 1598 (Fed. Cir. 1998). The Examiner "...can satisfy this burden only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in art would lead that individual to combine the relevant teachings of the references". *Id.*

Durham is concerned with optical spectroscopic information storage. There is no expectation of success that Oshima et al. can be modified as suggested in the FOA 03/06, while still functioning as desired by Oshima et al.. According to the *Interconnect* court:

> [n]ot only must the claimed invention as a whole be evaluated, but so also must the references as a whole, so that their teachings are applied in the context of their significance to a technician at the time - a technician without our knowledge of the solution.

Interconnect Planning Corp. v. Feil, 227 U.S.P.Q. 543, 551 (Fed. Cir. 1985) Also critical to this Section 103 analysis is that understanding of "particular results" achieved by the invention. *Id.*

Here, no motivation or expectation of success has been established for the combination of Oshima et al. with Gonzalez et al. and/or with Durham. Hence, no *prima facie* case of obviousness has been established. Reconsideration and withdrawal of this rejection are respectfully requested.

Applicants note that, contrary to the statement in the FOA 03/06, Claims 19 – 24, 26, 33 – 36, and 48, are all novel and non-obvious in view of the art of record. Additionally, with respect to Shchegolikhin et al., this reference was relied upon to also modify Oshima et al. As stated in the prior response, there is no teaching or motivation to modify Oshima et al. with Shchegolikhin et al. Shchegolikhin et al. fails to teach or suggest the device or method of the claims of the present application, and provides no motivation or expectation of success to modify Oshima et al. As with the other supporting references of record, mere conclusory statements are employed as the motivation to combine. Such statements to not meet the burden of establishing a *prima facie* case of obviousness. Hence, the present claims are patentable in view of Oshima et al. in view of Shchegolikhin et al.

It is believed that the foregoing remarks fully comply with the Final Office Action and that the claims herein should now be allowable to Applicants. Accordingly, reconsideration and withdrawal of the rejections and allowance of the case are respectfully requested.

If there are any additional charges with respect to this Amendment or otherwise, please charge them to Deposit Account No. 07-0893.

Respectfully submitted,

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